fishnote

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NSW FISHERIES

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Policy and Guidelines for Fish Friendly Waterway Crossings

This Fishnote provides a summary of the specific legislation and policy requirements that must be observed by those intending to plan, design and construct waterway crossings in NSW.

Waterway crossings such as bridges, roads, causeways, culverts and similar structures have an impact on fish and aquatic habitats. Habitats can be damaged during the construction of waterway crossings by the removal of riparian and in-stream vegetation as well as disturbance to the bed and bank of the waterway. Other impacts can include the creation of long-term barriers to fish movement, bed and bank erosion and continuing pollution from erosion and sedimentation.

This Fishnote should be used in conjunction with:

- "Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings" (Fairfull and Witheridge 2003)
- Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (NSW Fisheries 1999).

These documents are available from NSW Fisheries offices or website at www.fisheries.nsw.gov.au.

Fairfull and Witheridge (2003) provides a comprehensive overview of the best way to plan, design, construct and maintain waterway crossings to minimise impacts on fish passage and aquatic habitats and must be followed in NSW.

Comprehensive engineering guidelines for the design and construction of "fish and fauna friendly" waterway crossings are found in Witheridge (2002). Both documents were developed with the input of a national steering committee of experts in the field of road design, construction and fish passage.

Other factors should also be considered in addition to providing fish passage, such as public safety, social and budgetary constraints, and therefore each crossing must be assessed on a case-by-case basis.

Legislation

The activity of constructing waterway crossings may require approval under Part 7 (Division 3) of the Fisheries Management Act 1994 (FM Act) to dredge and/or reclaim. Dredging works may be required to construct the footings or foundations for the crossing. Reclamation works could include the construction and replacement of pylons and abutments for bridges, creation of in-stream construction pads to access the works or the placement of material in a waterway to construct temporary or permanent waterway crossings.

Generally, a local government authority or individual will require a permit to carry out any dredging or reclamation work unless the works are authorised by another public authority (other than a local government authority). Part 7 (Division 3) requires that a public authority must notify the Minister for Fisheries before it carries out or authorises the carrying out of any such works and must consider any matters raised by the Minister.

Waterway crossings constructed in tidal waters may also require a permit under Part 7 (Division 4) of the FM Act if the construction is likely to harm marine vegetation such as seagrass, mangroves or marine macroalgae (seaweeds).

Consideration must also be given to potential impacts of the crossing design and construction on threatened species, populations, ecological communities or their habitat (including 'critical habitat') listed under the FM Act.

Environmental assessment and planning for any new road works, waterway crossings or maintenance programs for existing structures requires the completion of an '8 part test'. The '8 part test' (a series of eight questions) must be completed in order to assess the significance of the impact of the proposed works on listed threatened species, populations or ecological communities. If the '8 part test' indicates a significant impact(s) then a Species Impact Statement (SIS) may also be required. Further information on threatened species is provided on NSW Fisheries website at www.fisheries.nsw.gov.au.

A permit may also be required under s.219 of the FM Act for any works, which may result in the temporary or permanent blockage of fish passage within a waterway. Such blockages can include silt fencing across waterways for sediment and erosion control and bunding and dewatering works during construction of crossings.

A permit may by required under s.37 of the FM Act to undertake any sampling of fish or other aquatic macroinvertebrates (e.g. for environmental assessment or monitoring purposes).

Permits may also be required under Part 5 (clauses 112-115) of the Fisheries Management (General) Regulation 2002 for any works which may involve the use of explosives, electrical devices or other dangerous substances within waters.

Waterway crossing design and construction must also be consistent with Habitat Protection Plans (HPP) gazetted under Part 7 (Division 1) of the FM Act. In particular, HPP No.1 outlines NSW Fisheries requirements for the management of 'snags' (large woody debris or boulders) and HPP No.2 outlines requirements for the management of seagrasses, which may be present on the construction site.

If you are planning to construct a waterway crossing in NSW it is recommended that you contact your nearest regional NSW Fisheries staff (see contact list) to discuss your proposal. They can provide you with advice on permit and approval requirements.

The permit application form for dredging and reclamation, harm to marine vegetation, blockage of fish passage and use of explosives, electrical devices or other dangerous substances within a waterway can be found on the NSW Fisheries website at www.fisheries.nsw.gov.au under the "Aquatic Habitats" section.

Policy for waterway crossings

The following policies apply to waterway crossings in NSW:

(a) Waterway crossings must be designed and constructed in accordance with Fairfull and Witheridge (2003). This document can be obtained from NSW Fisheries offices or from the Department's website at www.fisheries.nsw.gov.au.

(b) For any waterway crossing proposal, an aquatic habitat and fish assessment should be undertaken (see Table 1).

(c) When proactively rehabilitating existing waterway crossings to improve fish passage, efforts should focus on those crossings located at the lowest end of the catchment where the numbers and diversity of fish species is generally greatest.

(d) The construction of waterway crossings will generally not be permitted if the work involves harm to marine vegetation (in particular mangroves and seagrass), unless rehabilitation or mitigation measures can compensate the harm in line with NSW Fisheries Policy and Guidelines for Aquatic Habitat Management and Fish Conservation (NSW Fisheries 1999).

(e) Fish passage must not be restricted at any time, unless the appropriate permit has been granted by NSW Fisheries. If a project requires fish passage to be temporarily blocked (e.g. construction of bunds, installation of silt fences across a waterway), and no feasible alternative exists, then NSW Fisheries must be informed and a permit obtained before the works are commenced. The timing of the works should also be determined so as to minimise the interference with the possible migration of fish within the waterway.

(f) Spawning grounds, such as gravel beds in areas where salmon or trout are likely to occur, must not be dredged or removed from within a waterway unless approval has been granted by NSW Fisheries.

(g) Generally, where a woody snag is in the site of the proposed waterway crossing, lopping should be considered as the first priority for the management of the snag. Where lopping will not solve the problem, re-alignment should be considered as the next possible management option, followed by relocation. Removal of a snag is the least desirable alternative and should only be adopted as a last resort. Local councils and other public authorities are required to notify NSW Fisheries of any proposed works, which involve the lopping, realignment, relocation or removal of snags.

(h) Where aquatic habitats are designated "critical habitat" under Part 7A of the FM Act, then the waters of that habitat must automatically be designated a Class 1 waterway (see Table 1 in Fairfull and Witheridge (2003)), and will be subject to the preferred engineering solutions outlined. A SIS must also be prepared for the works.

- Road crossing restricting fish passage -

- Same road crossing designed to allow fish passage -

(i) Where a project is identified as being in the potential range of a listed threatened species, population or ecological community under the FM Act, and the area has not been declared a "critical habitat", the following should apply:
   (i) if the determining/consent authority determines that the project will not have a significant impact after considering an '8 part test', then the proposed water way crossing(s) will be accepted, subject to compliance with this Fishnote, and any other relevant approvals, including those required from NSW Fisheries.
   (ii) if the determining/consent authority determines that the project will have a significant impact via the '8 part test', then the proposed project should be modified where possible (e.g. causeway crossing changed to a culvert crossing, culvert changed to a bridge crossing or new site selected) and the '8 part test' reapplied. If the modified project still results in a significant impact, then the waterway will be classified as a Class 1 waterway (see Table 1 in Fairfull and Witheridge (2003)) and the preferred engineering solutions outlined in Table 1 will apply. A SIS must also be prepared for the project.
   (iii) if the determining/consent authority determines that the project will have a significant impact via the '8 part test' (even after the completion of step ii above), the waterway will be classified as a Class 1 waterway (see Table 1 in Fairfull and Witheridge (2003)) and the preferred engineering solutions outlined in Table 1 will apply. A SIS must also be prepared for the project.

(j) Where a road project is likely to involve the loss of aquatic habitat, NSW Fisheries will request that habitat rehabilitation or environmental compensation be used to mitigate the damage.

(k) All possible care should be taken to ensure that sediment from road works does not enter any water ways. Sediment and erosion control plans should be developed and implemented and copies made available to NSW Fisheries on request.

(l) In order to minimise sedimentation, fill or excavated material must not be stockpiled in flood prone areas. Particular care should be taken in siting stockpiles and dumps. Sites should be situated either above mean high water mark in tidal areas, or be secure from a 1 in 10 year flood level and have effective sediment control works to contain any runoff.

(m) In the case of emergency waterway crossing repair works, NSW Fisheries should be notified of the proposed emergency repair works prior to their commencement. Basic information, such as the location of the works, classification of the waterway where the works are to be completed (i.e. Table 1 in Fairfull and Witheridge (2003)), the need for the works and proposed construction methods can be outlined either by phone or facsimile to your nearest NSW Fisheries office, (see contact list). NSW Fisheries will generally be able to issue a dredging and reclamation permit within 24 hours of notification via facsimile. The permit will be issued subject to the receipt of full documentation (in line with this document) and relevant permit fees as soon as possible after the emergency works have been completed. As most emergency works are of a temporary nature, the full documentation should also address how the structure will be permanently repaired (where relevant).

Guidelines for waterway crossings

The following guidelines apply to waterway crossings in NSW:

(a) Sediment to be used in dredging or reclamation should be tested for contaminants prior to any works (see ANZECC (2000)). Contaminated fill or dredge spoil containing toxic substances, such as heavy metals, organochlorines, acid sulphate soils, dinoflagellates, etc., must not be dredged or used in reclamation.

(b) Dredging or reclamation works should aim to have no net impact on the receiving watercourse. As a minimum, water quality assessments should include analysis of dissolved oxygen, pH, turbidity, temperature, nutrients and salinity and should take into account the existing water quality status of the receiving water course.

(c) Sediment controls along drainage lines should be left in place to control sediment entering a waterway after the construction phase is completed and until the site has been fully stabilised.

References

Australia and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand (ANZECC) (2000) Australia and New Zealand Guidelines for Fresh and Marine Water Quality: Volume 1 - The Guidelines. Australia and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand.

Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries, Cronulla, 16 pp.

NSW Fisheries (1999) Policy and Guidelines Aquatic Habitat Management and Fish Conservation. (Eds. A. Smith and D. Pollard) NSW Fisheries, Cronulla.

Witheridge, G. (2002) Fish Passage Requirements for Waterway Crossings - Engineering Guidelines. Catchment and Creeks Pty Ltd, Brisbane.

- Before & after photos of the same road crossing rehabilitated to allow safe fish passage -

Table 1 - Aquatic habitat and fish assessment requirements for waterway crossings

The Department of Infrastructure, Planning and Natural Resources has released a document entitled, "*Guidelines for Assessment of Aquatic Ecology in EIA*" (1998) which should be referenced to assess aquatic flora and fauna impacts during the preparation of environmental assessment documentation under Parts 4 or 5 of the *Environmental Planning and Assessment Act 1979*.

The aim of an aquatic assessment should be to define the presence of aquatic habitat within both the study site and regional area, and upstream or downstream of any proposed waterway crossing sites. Some points to consider in assessing aquatic habitats include:

- the characteristics of the watercourse (e.g. Is it a gully, intermittent stream or major river? Does it have deep pools or in-stream gravel beds? Is it a wetland? Does the waterway interconnect with other waterways or wetlands upstream or downstream?)
- the flow regime of the watercourse (e.g. Is it an intermittent or permanently flowing stream? What is the water velocity of the flow?)
- what is the water quality like? (e.g. discolouration, sedimentation, turbidity, pH, dissolved oxygen, nutrients?)
- what are the types of land uses along the waterway? (e.g. agricultural, urban, aquaculture)
- is riparian vegetation present or absent? (i.e. Are the species native or exotic? What condition are they in?)
- is in-stream vegetation present or absent? (i.e. Are the species native or exotic? What condition are they in?)
- are there wetlands nearby? (e.g. in-stream or off-stream)
- what is the substrate type? (e.g. rock, sand, gravel, alluvial substrates)
- the presence of refuge areas (e.g. Are there wetlands nearby which could be interlinked by the waterway during flow? Are there pools of water above or below the crossing which could be fish habitat?)
- the presence of spawning areas (e.g. Are gravel beds, riparian vegetation, snags (large woody debris or boulders) present?)
- the presence of natural or artificial barriers to fish passage both upstream and downstream (e.g. weirs, dams, waterfalls or cascades, other waterway crossings)
- the types of fish or other aquatic species likely to inhabit the area (based on their known distribution range within the scientific literature)
- whether any threatened aquatic species are present
- whether the area has been declared a "critical habitat"
- the timing of construction (i.e. Will construction coincide with a migratory season for fish?)

In most cases, in areas where fish and/or other aquatic fauna are well documented, and no threatened species are recorded, a site inspection and desktop review of the study site and regional area may be the only assessment required, and may preclude the need for a detailed scientific aquatic survey. However, this decision must be justified in the environmental assessment by the proponent or determining authority. Consultation with NSW Fisheries staff is also advised during the planning phase to determine the required level of assessment.

When do I need to undertake an aquatic survey?
NSW Fisheries recommends that a detailed aquatic survey should only be undertaken:

(a) where the project is on a Class 1 or 2 water course (see Table 1 in Fairfull and Witheridge (2003)), or where an '8 part test' has identified that there may be a significant impact on a listed threatened species under the FM Act and an SIS is required;
(b) where the project area crosses through, over or within a "critical habitat" and an SIS is required; and;
(c) only after direct consultation with staff from NSW Fisheries. A permit must be obtained from NSW Fisheries prior to any aquatic fauna sampling.

Contact list for regional NSW Fisheries staff who can assist you with inquiries:

Region	*Catchments Covered by the Region*	*Postal Address*	*Phone*	*Fax*
Upper North West	Namoi, Gwydir, Barwon-Darling	NSW Fisheries Office of Conservation PO Box W47, Tamworth NSW 2340	(02) 6765 4591	(02) 6762 1993
North West	Bogan, Macquarie, Castlereagh	NSW Fisheries Office of Conservation PO Box 99, Wellington NSW 2820	(02) 6845 4439	(02) 6845 4452
Central West	Murrumbidgee, Lachlan	NSW Fisheries Office of Conservation PO Box 182, Narrandera NSW 2700	(02) 6959 9028	(02) 6959 2935
South West	Murray, Lower Darling	NSW Fisheries Office of Conservation Unit 3/556 Macauley Street, Albury NSW 2640	(02) 6042 4208	(02) 6021 0113
North East and Border Rivers	The Border Rivers and the coastal catchments from Queensland border to Macleay River	NSW Fisheries Office of Conservation PO Box 154, Ballina NSW 2478	(02) 6686 2018	(02) 6686 8907
Central	Coastal catchments from Hastings to Georges River	Office of Conservation Fisheries NSW Private Bag 1, Nelson Bay NSW 2315	(02) 4982 1232	(02) 4982 2306
South East	Coastal catchments from Wollongong Coast to Victorian border	Office of Conservation Fisheries NSW PO Box 456, Nowra NSW 2541	(02) 4423 2080	(02) 4423 2007